

### REMARKS

Claims 26-42, 51, 52, 54-58, 60-62 and 64-83, all the claims pending in the application, stand rejected. Claims 72 and 73 are withdrawn from consideration. Claims 26, 39, 51, 52, 54, 58, 71, 77-79, 81 and 82 are amended. Claims 38, 70, 72 and 73 are cancelled without prejudice or disclaimer.

#### Limitation by "Consisting Of"

Applicants have amended independent claims 26, 77, 78 and 81 to specify the composition of at least one of the recited "inner," "intermediate" and "outer" layers as limited to the recited materials. In order to cover the case where additives and other non material substances are used, such as conventional additives and contaminants, claims 51, 54 and 58 are amended.

Consistent with established principles, as reflected in MPEP 2111.03, the open-ended word "comprising" has been replaced by the more narrow formulation "consisting of" wherever appropriate. According to the MPEP and underlying case law, the phrase **limits** the scope of a claim to the specified material or steps "and those that do not materially affect the basic and novel characteristic(s)."

In order to cover the inclusion of additives in one or more of the layers, claims 51, 52, 54 and 58 have been placed into independent form.

Support for the limitation of the content of the inner and outer layers "consisting of a mixture of different polyamide-homopolymers and a compatibilizer" is found at least in paragraphs [0014]-[0020], [0027]-[0029], [0037]-[0041] and [0044] of the published application.

Support for the limitation of the content of the intermediate layer "consisting of ethylene/vinyl alcohol-copolymer" is provided at least in paragraphs [0021], [0026], [0042] and [0043] of the published application.

#### Limitation by Excluding EVAL from Compatibilizer

In addition, Applicants have amended the independent claims 26, 77, 78 and 81 to specify that (1) the compatibilizer is one of an impact strength modifier, an elastomer or a rubber and (2) expressly excludes EVAL. Portion (1) of this limitation was specifically recited in

original and now cancelled claims 38 and 70. Portion (2) is gleaned from the entire specification, where EVAL is not mentioned as a component of any compatibilizer formulation used with the invention. In particular, the variants 4 and 5 as explained with regard to Table 1, beginning at paragraph [0048] support this limitation.

Notably, the prior art cited by the Examiner does not meet this limitation, even at the lowest level of EVAL, as at least some EVAL is required to be used as a compatibilizer in the prior art. Moreover, even the trace presence of EVAL in the inner or outer layers would be incompatible with the express claim requirement for impact strength modifier, elastomer or rubber.

#### ***Interviews and Withdrawn Rejections***

The Examiner, consistent with the results of the interview conducted with the Applicant's representative on December 27, 2007, has now withdrawn the rejection of Claims 26 - 39, 41 - 42, 51 - 52, 54 - 58, 60 - 62, 64 - 66, 68 - 71, and 74 - 83 under 35 U.S.C. 102(b) as being anticipated by Flepp et al (U.S. Patent No. 6,555,243). Applicant appreciates the Examiner's consideration of the asserted distinctions of the claimed invention over the prior art.

Applicants also wish to express their appreciation for the courtesy extended to and discussion held with Applicants' representative on May 9, 2008 with regard to the present new rejections. Applicants' current amendments and the manner in which they distinguish over the newly cited prior art have been formulated on the basis of the Examiner's helpful comments and suggestions. Applicants' interview summary accompanies this Amendment.

#### ***Claim Rejections - 35 USC § 102***

**Claims 26, 40, 67, 78 and 81 are rejected under 35 U.S.C. 102(b) as being anticipated by Mason et al (U.S. Patent No. 4,950,515).** This rejection is traversed for at least the following reasons.

#### **Amended Claims 26, 78 and 81**

The Examiner asserts that Mason et al discloses a thermoplastic composite comprising multiple layers (column 6, lines 9 - 17) comprising a mixture of different polyamides homopolymers (column 2, lines 50 - 58) and ethylene vinyl alcohol copolymer, which is a

compatibilizer (column 4, lines 9 - 11), wherein the composite is a hollow body having a hollow inner space (container; column 6, line 20). Thus, the Examiner concludes that Mason et al discloses an inner layer comprising a mixture of different polyamide homopolymers and a compatibilizer which is adjacent to and defines an inner space, an intermediate layer comprising ethylene vinyl alcohol copolymer and an outer layer comprising a mixture of different polyamide homopolymers and a compatibilizer, as claimed.

Claims 26, 78 and 81 are now amended to expressly specify the composition of each layer as being substantially limited to the recited composition for that layer. Specifically, each claim now expressly provides that “the intermediate layer is consisting of ethylene/vinyl alcohol-copolymer.” Accordingly, the layer would not comprise other materials consistent with the explanation given in MPEP 2111.03. As noted at the beginning of Applicants’ remarks, there is support for this limitation in the original specification.

In addition, one of the “inner layer” and “outer layer” is defined such that the layer “is consisting of a mixture of different polyamide-homopolymers and a compatibilizer, said compatibilizer (1) being selected from the group consisting of: impact strength modifiers, elastomers and rubbers and (2) having no ethylene/vinyl alcohol-copolymer”

These three amended independent claims now have a clear focus on a specific and different composition for each of the recited adjacent layers that achieves the unique results of the present invention, as explained at least at pages 4 and 6 of the original specification, namely a three-layer hollow structure that is based on an ability to join three layers without adhesives, the outer and inner layers being durable, stable and corrosion resistant, while the inner layer serving as a barrier layer that is crack resistant and has impact strength. This recitation precludes a structure that has identical or even similar adjacent layers from reading on the claim.

### **Mason**

As a preliminary matter, Applicants wish to place the technical disclosure of Mason into proper context.

Mason relates to compositions comprising a mixture of three components, a polyamide, a polyolefin and EVAL-copolymers (see abstract as well as column 2:7-11). In this mixture, the EVAL-copolymers act as compatibilizer between the polyamide and the polyolefin in a blend (see abstract and column 4:9-11). In other words, Mason teaches use of a blend specifically comprising one polyolefin and one polyamide, where the EVAL-copolymer acts as a

compatibilizer between the polyolefin and the polyamide (see column 4:9-11). Notably, EVAL is the ONLY compatibilizer used in Mason et al.

Characteristics of EVAL-Copolymers in Mason

In Mason, EVAL is being used exclusively as a compatibilizer, and only to compatibilize (1) a polyamide and (2) a polyolefin. However, in general, EVAL is known to be a rather **brittle** polymer. Reference in this respect is made to Flepp (US 2002/0012806), specifically the last sentence of paragraph 0012 thereof which reads “In fact, ethylene vinyl alcohol copolymers ...are known as extraordinarily brittle with low strain at break.”

Also, in Mason et al, where the mixture is used in a multi-layer product, the field involves food or liquid packaging. However, due to the well-known brittle nature of EVAL, one skilled in the art would not have considered EVAL as compatibilizer for other applications, such as the automotive sector where safety and reliability are important requirements. Specifically, one skilled in the art would not consider use of EVAL as a further constituent of the inner or outer layer of a hose, as it would reduce the impact strength resistance. Indeed in the technical field of hoses and the like for the automobile sector (the field of the Invention), much higher impact resistance is required than in the field of food packaging (the field of Mason). Thus, one skilled in the art would not consider adding EVAL to a polyamide mixture acting as an outer or inner layer, as it would increase its brittleness and correspondingly reduce the impact strength. Indeed, as now recited in the claims, EVAL is not used as a compatibilizer in the inner and/or outer layers.

EVAL is NOT an Impact Strength Modifier, Elastomer or Rubber

Given this acknowledged characteristic, the material EVAL is neither an impact strength modifier, an elastomer nor a rubber, as now expressly claimed. To the contrary, EVAL would have the **opposite** effect and reduce impact strength, even at the lowest levels taught in Mason et al. Moreover, it does not have rubber or elastomer properties, again, even at the lowest levels taught in Mason et al, alone or in combination with other materials taught in the reference.

As a result, EVAL does not belong to the group of compatibilizers as claimed, since its properties are contrary to those of the specified group, as defined by the claim amendments.

Indeed, based on the newly added limitation to the claims that further defines the compatibilizer, EVAL would be **excluded** as a claimed compatibilizer.

Mason's EVAL Has No Double Function

The claimed compatibilizers, as now defined to consist of a specific group of compatibilizers, has two important functions.

First, the compatibilizer acts to compatibilize the further polyamide-homopolymer constituents within the layer. According to the present invention two polyamides are selected, and specifically two polyamide-homopolymers, which can be (and as a matter of fact are) incompatible. By contrast, the compatibilizer of Mason provides compatibility between a polyamide and a polyolefin. This provides a first difference in function.

Second, the compatibilizer in the present invention also acts to increase the impact strength of the corresponding structure. This feature is not present in Mason and provides a second difference in function.

In short, the proposed group of compatibilizers provides a **double function** which is neither disclosed nor suggested by Mason, thereby providing a third difference in function.

Mason's Multi-Layer Film Only Uses A Blend With EVAL

In Mason, EVAL is being used exclusively as a compatibilizer to compatibilize a polyamide and a polyolefin. EVAL is not used as a dominant component, without having a compatibilizing function, in any layer in Mason. By contrast, Applicant's intermediate layer uses EVAL in a manner that provides a barrier layer but does not serve a compatibilizer function.

Mason's Multi-Layer Film Does Not Use Claimed Multi Layer Compositions

According to the disclosure of Mason (see column 5:63-in column 6:20) the films that use EVAL as a compatibilizer in a blend can be made of *laminates*. There also is a teaching that a layer of the blend can be used with layers of polyolefins or polyamides (see column 5:66-68). Further possibilities for such additional layers are given as layers of PVC, PVA, linear saturated PE such as PET, PBT, and so forth (see column 6:1-8).

However, there is no teaching of any outer or inner layer that “is consisting of a mixture of different polyamide homopolymers and a compatibilizer, said compatibilizer being selected from the group consisting of: impact strength modifiers, elastomers and rubbers.”

Further, there is no teaching of an intermediate layer that is “consisting of” EVAL.

No Anticipation

In sum, since there is no teaching of (1) at least one of an inner and outer layer with the mixture of different polyamide homopolymers and a compatibilizer, the compatibilizer being selected from the group consisting of: impact strength modifiers, elastomers and rubbers, and not containing EVAL, and (2) an intermediate layer consisting of EVAL as the component, there can be no anticipation.

Claims 40 and 67

The Examiner asserts that Mason et al disclose a compatibilizer in the range of 10% by weight (column 2, line 10). These claims would not be anticipated for reasons given for their parent claims.

*Claim Rejections - 35 USC § 103*

**Claims 27 - 39, 41 - 42, 51 - 52, 54 - 58, 60 - 62, 64 - 66, 68 - 77, 79 - 80 and 82 - 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mason et al (U.S. Patent No. 4,950,515) in view of Flepp et al (U.S. Patent No. 6,555,243).** This rejection is traversed for at least the following reasons.

First, as to claims 38 and 70, the rejection is moot in view of the cancellation of these claims. However, the limitations of these claims are added to the independent claims 26, 77, 78 and 81. As already demonstrated, EVAL, acting as a compatibilizer, does not have the claimed characteristic of being “selected from the group consisting of: impact strength modifiers, elastomers and rubbers.” Moreover, EVAL is expressly excluded as a compatibilizer from the composition. In the absence of this limitation, Mason et al cannot render this claim unpatentable. Flepp et al similarly does not teach a compatibilizer having the claimed characteristic.

Second, there is no teaching or suggestion that the materials and structures of Mason et al, which are directed to food industry containers requiring low durability and low cost, would be

considered for a combination with Flepp et al, which is directed to the automotive industry components requiring high durability and impact resistance but can tolerate high cost for these reasons.

Third, there is no teaching or suggestion in either reference that a modification of their compositions and structures on the basis of the teachings of the other reference would be of any value. Indeed, one skilled in the art would know not to use the compositions and structure from one in the environment of the other due to the lifetime, cost and durability factors.

Even if the person skilled in the art were to consider these two references at the same time, the structure according to the amended claims would not result since the direct and straightforward combination of the blended material in Mason et al with the composites of Flepp et al lead to undesirable brittle layers that are not from the recited groups. Moreover, nothing would lead to the specific layers claimed, as one skilled in the art would not know, without hindsight, which one or more of these layers could be replaced, since the blend according to Mason in view of its constituents (polyamide and EVAL-copolymer) would make it potentially a replacement for any of the four layers in Flepp et al. Finally, nothing in either reference, or the knowledge of one skilled in the art, would permit a realization that both layers of Flepp et al would have to be replaced by a single layer, and additionally, that the adhesion promoting layer, which is the actual key element of Flepp, could then be omitted.

### ***Conclusion***

All of the claims as now pending have limitations to the intermediate layer consisting of the EVAL composition and at least one of the adjacent inner and outer layers having an EVAL compatibilizer that is selected from the group consisting of: impact strength modifiers, elastomers and rubbers and does not include EVAL. None of these characteristics is found in the prior art. Thus, the claims should be considered patentable.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,

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